

February 2009 Climate Summary for Southwest Lower Michigan

Brandon Hoving
National Weather Service Grand Rapids, MI

Overview

The month of February featured a fairly wide range of weather from a few arctic blasts and occasional snow to warm southerly breezes and heavy rainfall. Overall, however, average daily temperatures and total precipitation were both above normal for the month. Table 1 shows this information. With the exception of Muskegon (and most likely other lakeshore areas), snowfall was slightly below normal for the month.

Figures 1-3 reveal the higher frequency of near to above normal temperatures for Grand Rapids, Lansing, and Muskegon. The warmest day of the month occurred on the 10th, when a warm front pushed through the region in association with a strong system in the upper Midwest. Temperatures climbed to 60° or higher in some locations, setting records in both Grand Rapids and Lansing at 61° and 60°, respectively. Figure 4 shows how much higher the average temperatures were compared to mean across not just Southwest Lower Michigan, but essentially stretching through the entire Lower Peninsula.

In terms of precipitation, all three climate sites were above normal largely because of the widespread heavy rain the region received during the 26th and 27th. See Figures 5-7 for the February precipitation trends. Grand Rapids and Muskegon set daily precipitation records of 1.37 inches and 1.65 inches, respectively, on the 26th. This heavy rainfall pushed river levels higher across the entire area, but flooding was not a major concern as most rivers crested below flood stage. Total precipitation for the month can be seen in Figure 8a, while the departure from mean is shown in Figure 8b. You can certainly see how all of Southwest Lower Michigan received above average precipitation for the month.

Snowfall was harder to come by when compared to January, but in spite of this all three sites added to their seasonal totals—especially Muskegon. By the end of the month, Grand Rapids and Muskegon would both be ranked 5th all time for seasonal snowfall totals. The main snow events occurred on the 14th and the 21st, although Muskegon did receive a decent amount of lake effect snow on the 19th at 5.3 inches. A relatively weak system brought a general 2 to 4 inch snowfall across the region early in the morning on Valentine's Day. One week later, a more potent system brought 4 to 8 inches of snow to Southwest Lower Michigan. The worst conditions occurred as lake effect snow contributed to the dynamics of the system during the evening hours on the 21st, when heavy snow squalls produced rapid accumulations and near whiteout conditions especially in and around the Grand Rapids metro area, south to Kalamazoo and then west toward the lakeshore. Figure 9a clearly shows the influence of Lake Michigan on monthly snow totals, while Figure 9b reveals that most areas were near to slightly below normal for snowfall.

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TABLE 1. Reported temperature, precipitation and snowfall amounts for February 2009 at selected climate stations in Southwest Lower Michigan. Normals are computed from 30-year averages from 1971-2000.

Location		Temperature (degrees F)	Precipitation (inches)	Snowfall (inches)
Grand Rapids	<i>Reported</i>	27.8	3.31	10.0
	<i>Normal</i>	25.0	1.54	12.2
	<i>Departure</i>	+2.8	+1.77	-2.2
Lansing	<i>Reported</i>	26.9	2.32	9.5
	<i>Normal</i>	24.0	1.45	10.6
	<i>Departure</i>	+2.9	+0.87	-1.1
Muskegon	<i>Reported</i>	27.1	4.05	22.7
	<i>Normal</i>	25.4	1.58	18.3
	<i>Departure</i>	+1.7	+2.47	+4.4

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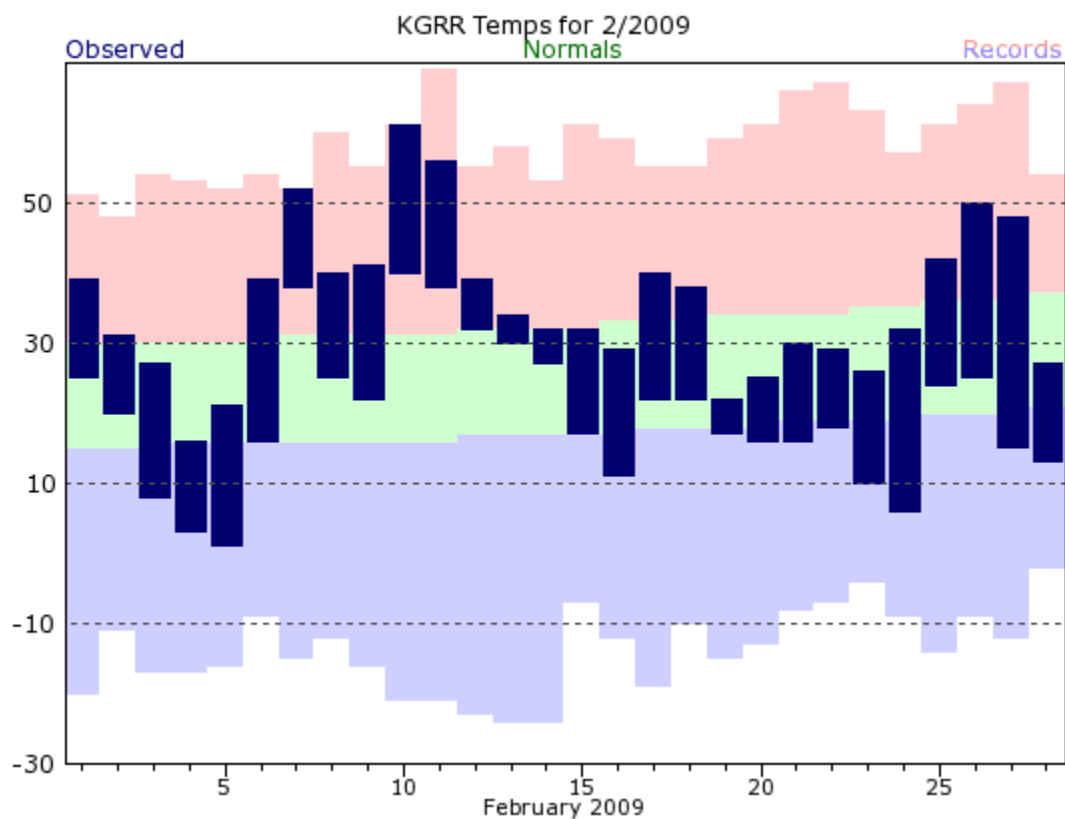


FIG. 1. Observed temperatures at the Grand Rapids International Airport. Dark blue bars are the temperature range for each day. The green strip indicates the normal range of temperatures. Record high and low temperatures are indicated at the top of the pink area and the bottom of the blue area, respectively. Normals computed as in Table 1.

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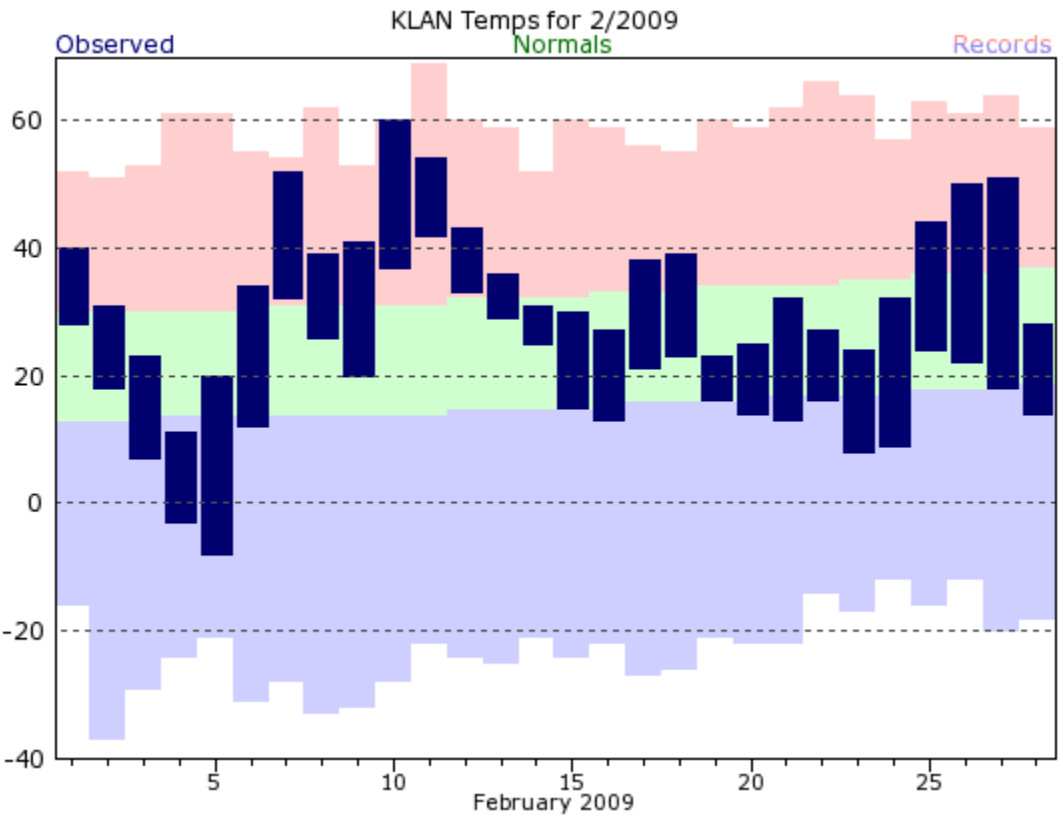


FIG. 2. As in Fig. 1, except for the Lansing airport.

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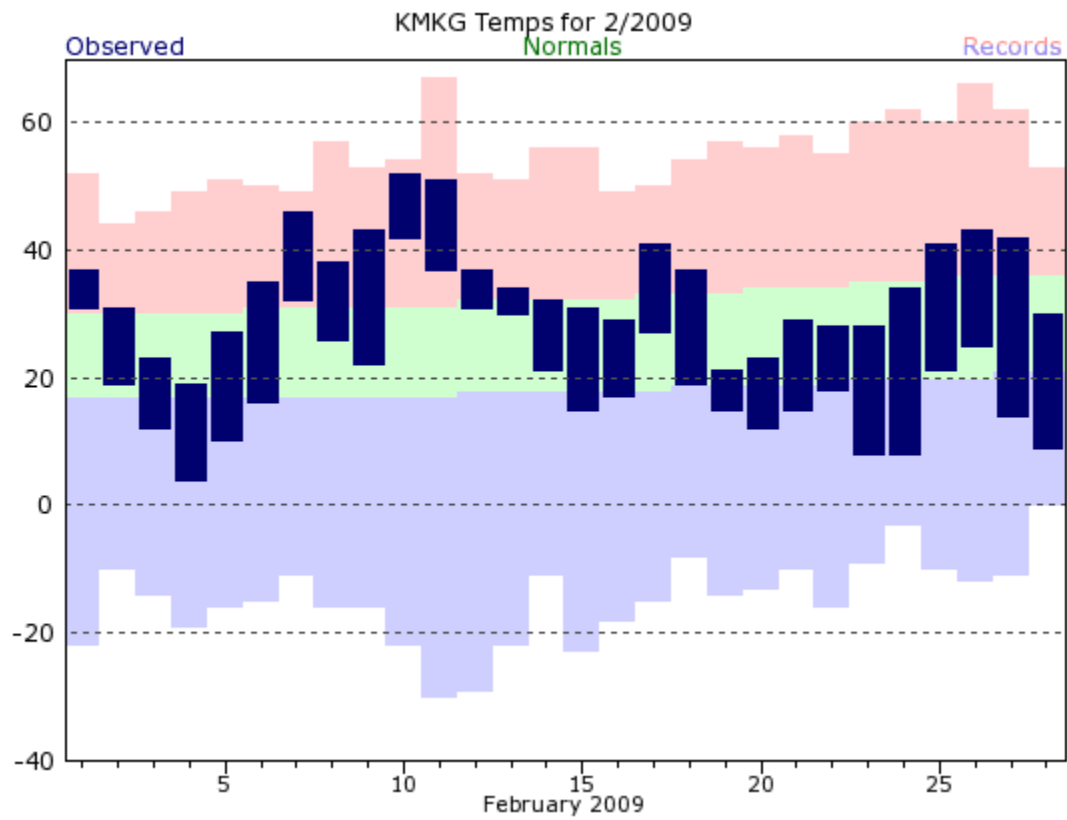


FIG. 3. As in Fig. 1, except for the Muskegon airport.

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Average Temperature Departure from Mean in Degrees F
February 1, 2009 to February 28, 2009

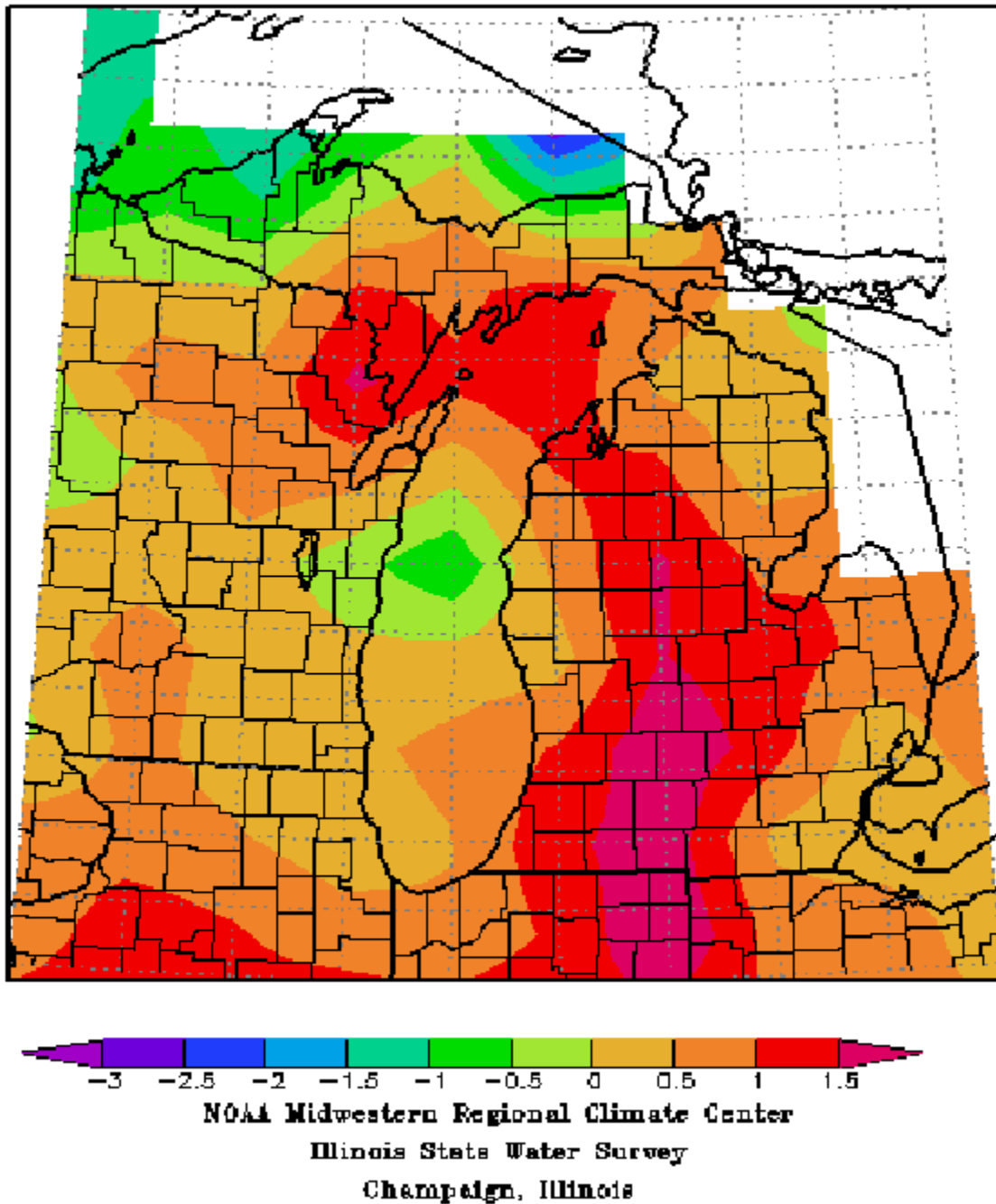


FIG. 4. Average temperature departure (degrees F) for February of 2009.

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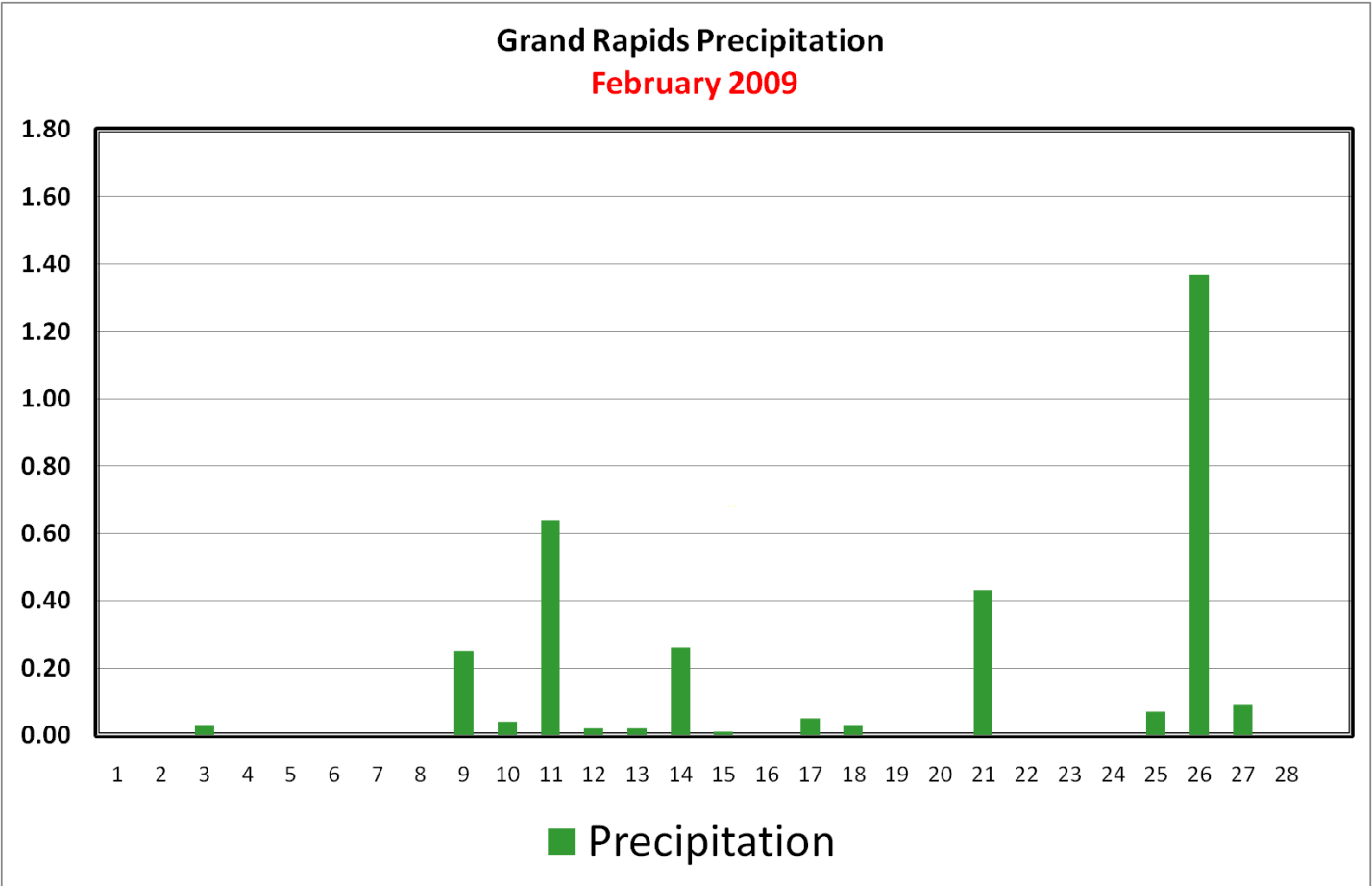


FIG. 5. Daily precipitation in inches for February of 2009 at the Grand Rapids International Airport.

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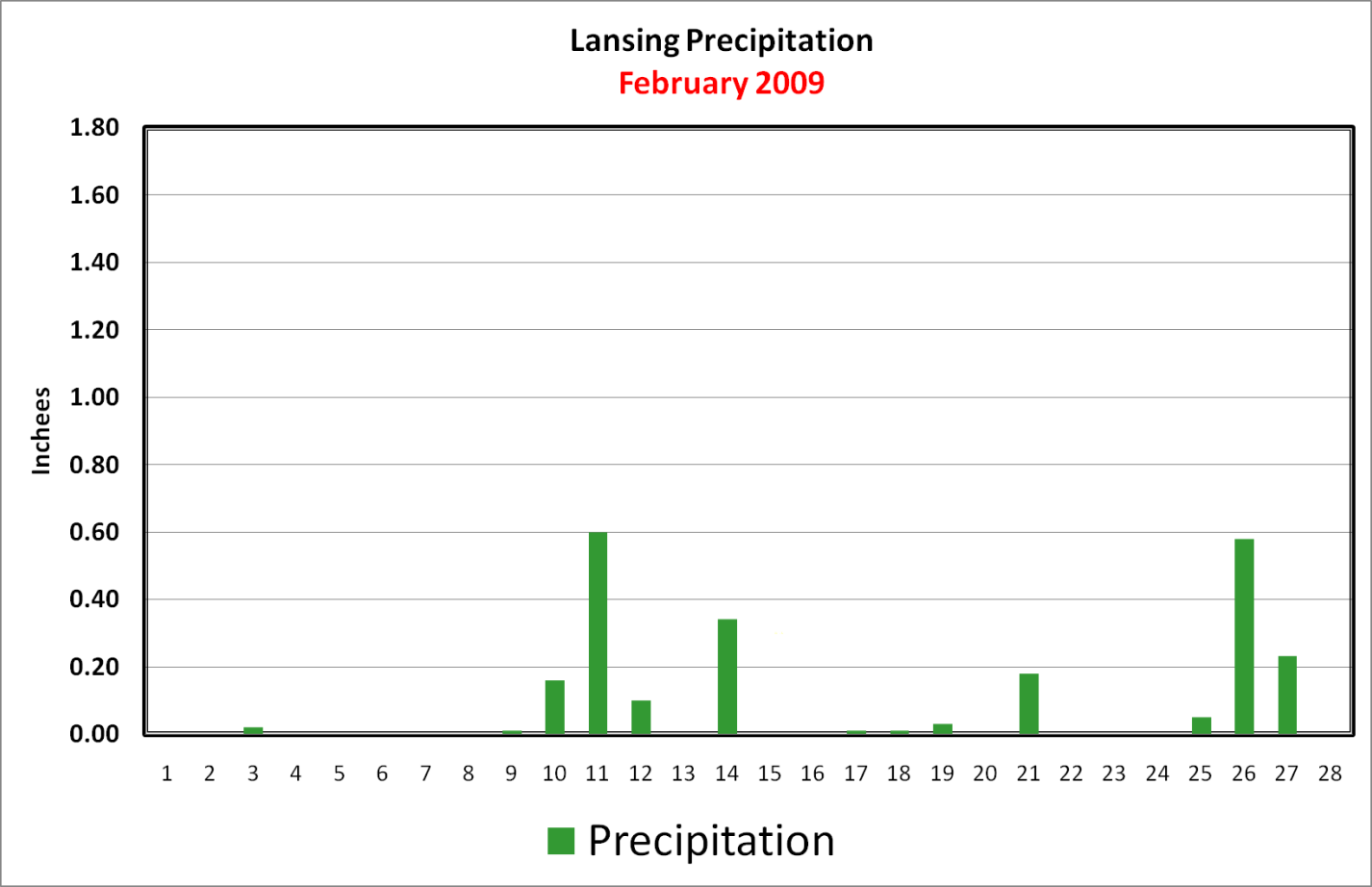


FIG.6. As in Fig. 5, except for the Lansing Capital City Airport.

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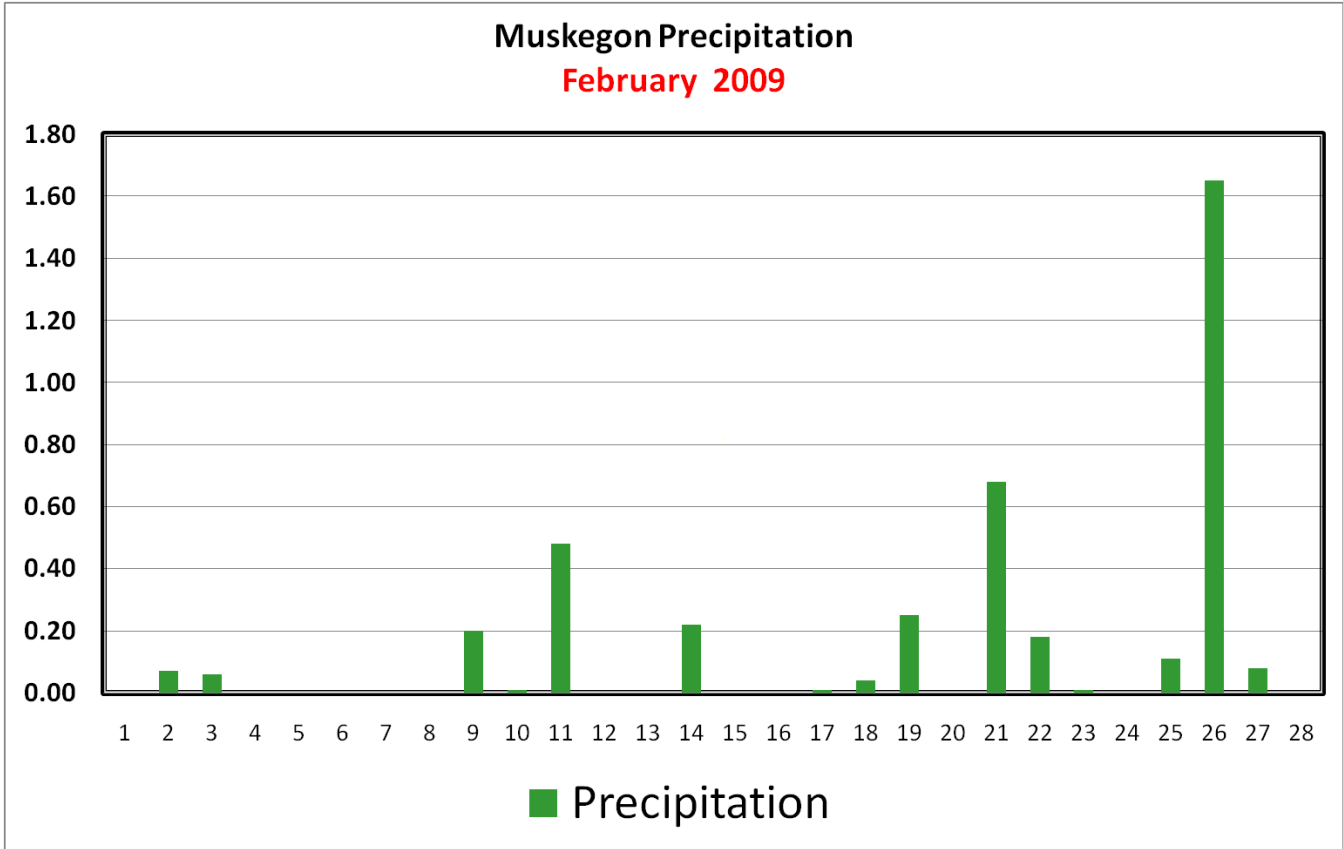
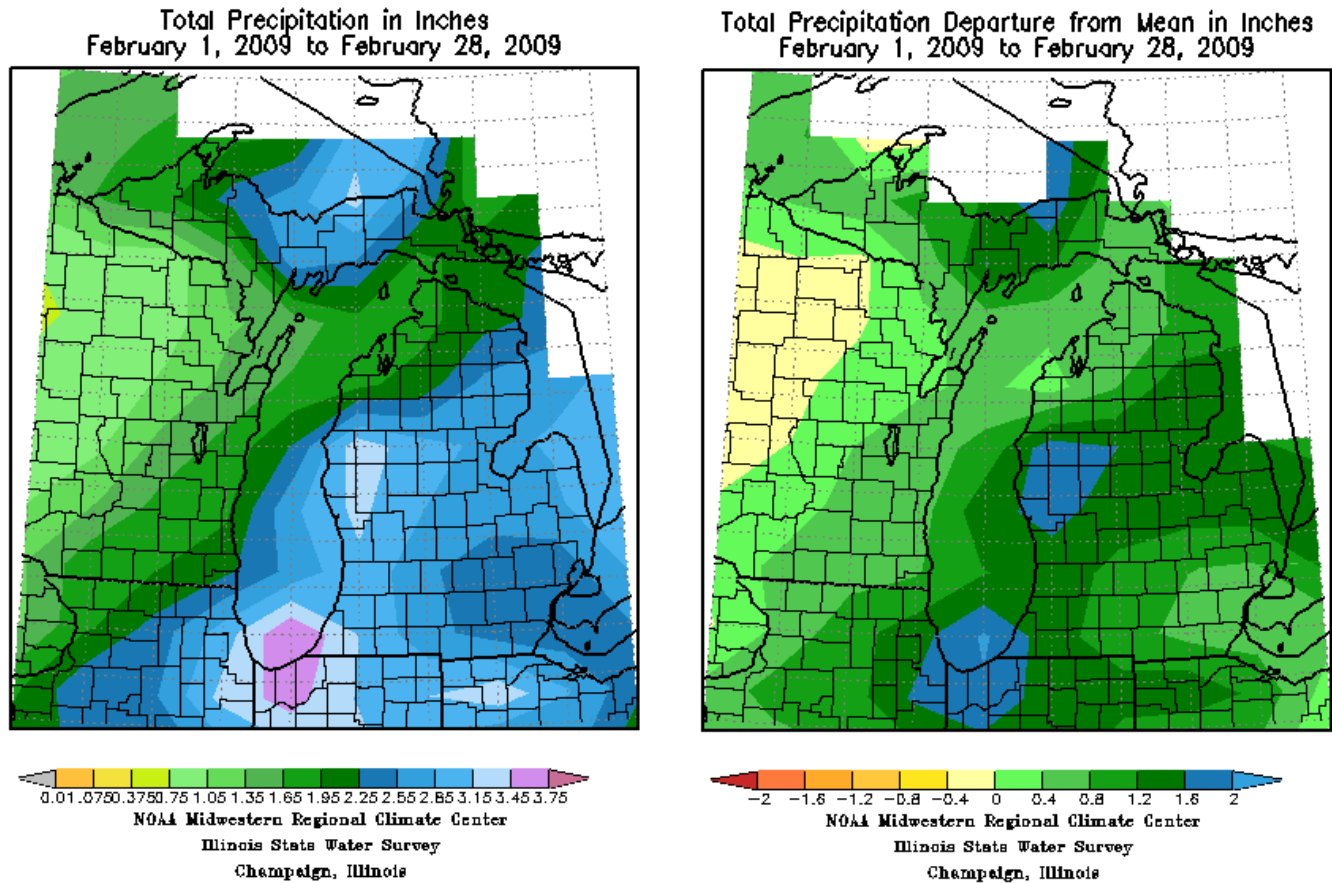


FIG. 7. As in Fig. 5, except for the Muskegon County Airport.

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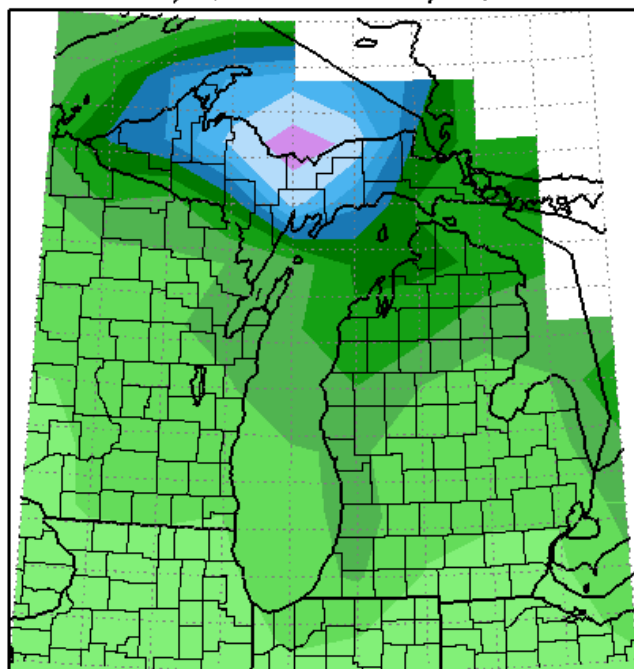
(a) Inches of Total Precipitation

(b) Total Precipitation Departure from Mean

FIG. 8. (a) Total precipitation in inches for February 2009, and (b) Total precipitation departure from the mean.

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Total Snowfall in Inches
February 1, 2009 to February 28, 2009

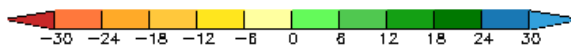
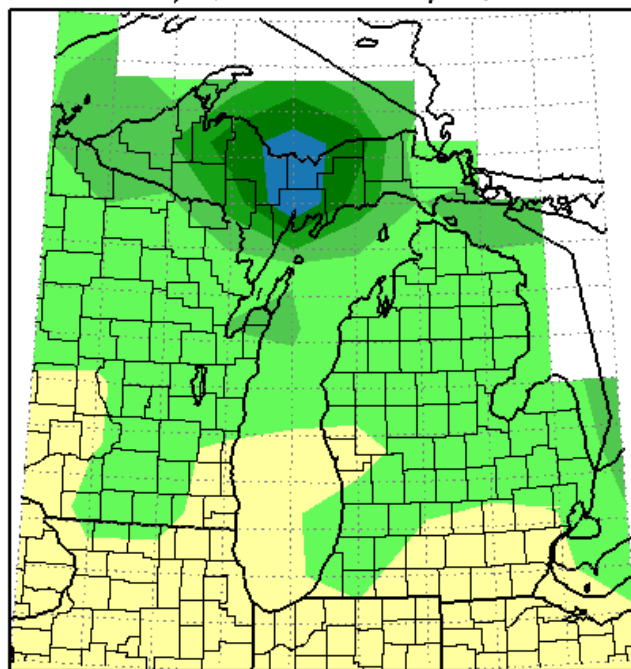


NOAA Midwestern Regional Climate Center

Illinois State Water Survey

Champaign, Illinois

Total Snowfall Departure from Mean in Inches
February 1, 2009 to February 28, 2009



NOAA Midwestern Regional Climate Center

Illinois State Water Survey

Champaign, Illinois

(a) Snowfall

(b) Snowfall departure from mean

FIG.9. (a) Snowfall in inches for February 2009, and (b) departure from the mean.

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Highlights of the month

1st – 6th

Lake effect snow showers developed on the 2nd and lasted through the 3rd, bringing a few inches of snow mainly to the lakeshore counties. The coldest three day stretch for the month occurred from the 3rd through the 5th.

6th-11th

This period was marked by moderating temperatures, periods of rainfall, and breezy conditions at times. Strong southerly winds brought record warmth to the area on the 10th, with temperatures climbing to around 60°. Both Grand Rapids and Lansing received over 0.8 in of rain over a three day period from the 9th through the 11th. Most of the snowpack melted during this time.

12th-16th

Besides colder temperatures, the main story was the relatively weak system that brought some accumulating snow to the region during the morning on Valentine's Day. Amounts were generally in the 2 to 4 inch range. See Figure 10 below. The coldest day during this stretch was the 16th, when high temperatures failed to reach 30° at all three climate sites.

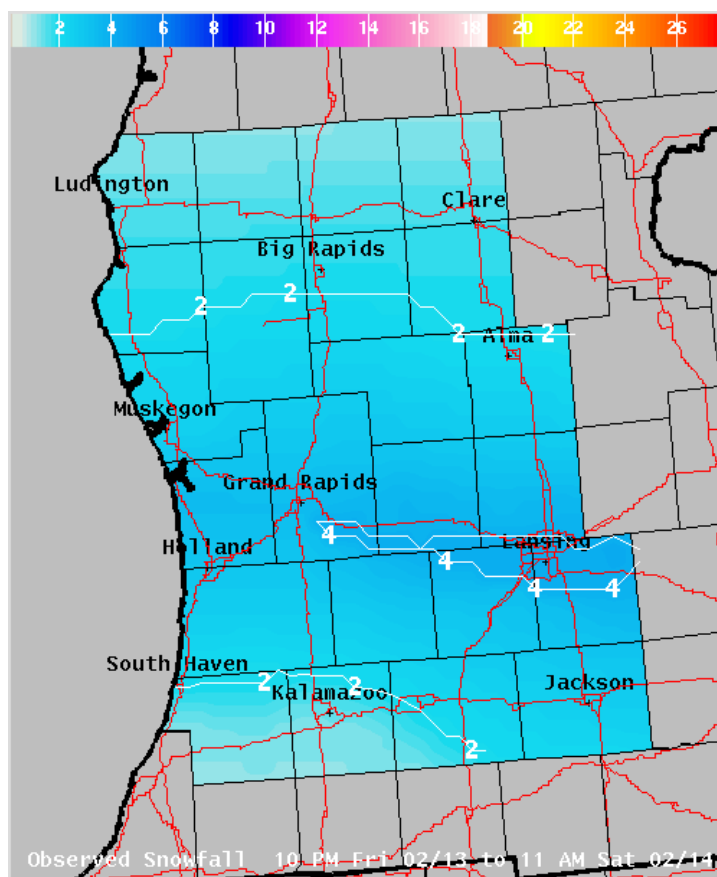


FIG.10. Storm total snowfall ending at 11am Saturday, February 14.

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17th-21st

Lake effect snows and a downward trend in temperatures marked this period, with two notable snowfall events occurring on the 19th and the 21st. Muskegon received 5.3 inches of lake effect snow on the 19th, while Grand Rapids and Lansing picked up a measly 0.2 of an inch each. Gusty northwest winds along the lakeshore created blowing snow and difficult driving conditions at times during the lake effect snow event. Given the wind direction, most of the heavy snow was confined to the lakeshore. Snowfall totals for the 19th can be seen below in Figure 11. On the 21st, West Michigan saw another decent snowfall which featured a combination of a low pressure system bringing snow to the region along with lake effect developing on the back side of the storm. Muskegon had a daily record of 8.0 inches on the 21st, while Grand Rapids received a modest 4.8 inches and Lansing had 3.8 inches. The heaviest snow occurred as the system was exiting the region and a few very heavy lake enhanced bands developed off Lake Michigan, creating a period of treacherous driving conditions during the evening hours from Grand Rapids to Kalamazoo and west toward the lakeshore. Storm total snowfall for the 21st can be seen in Figure 12.

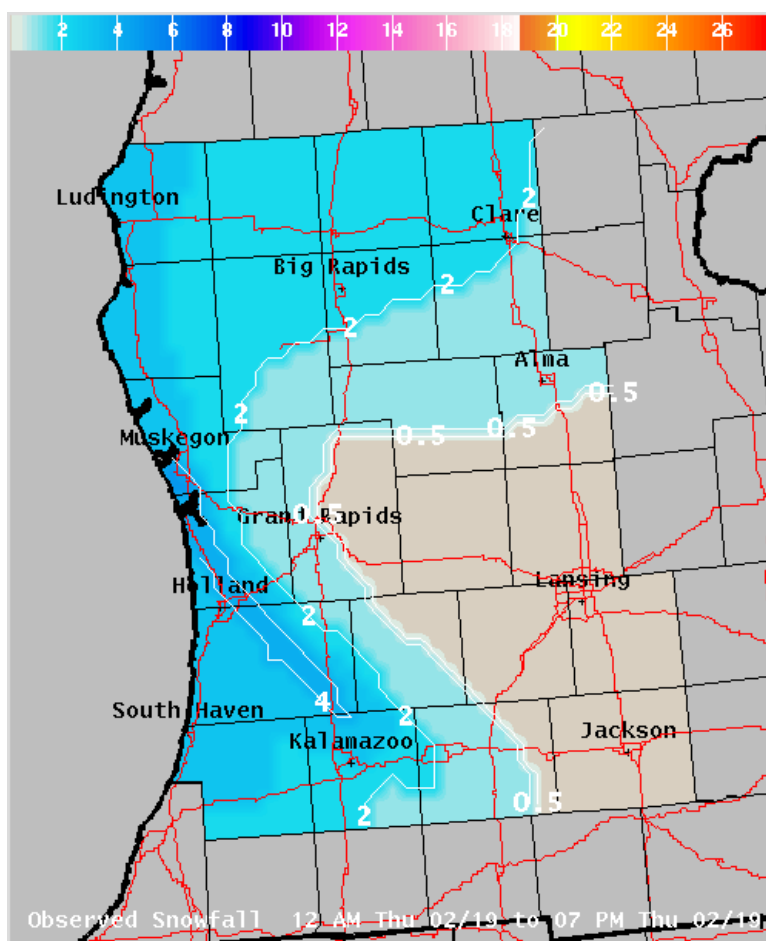


FIG.11. Lake effect snowfall totals on Thursday the 19th.

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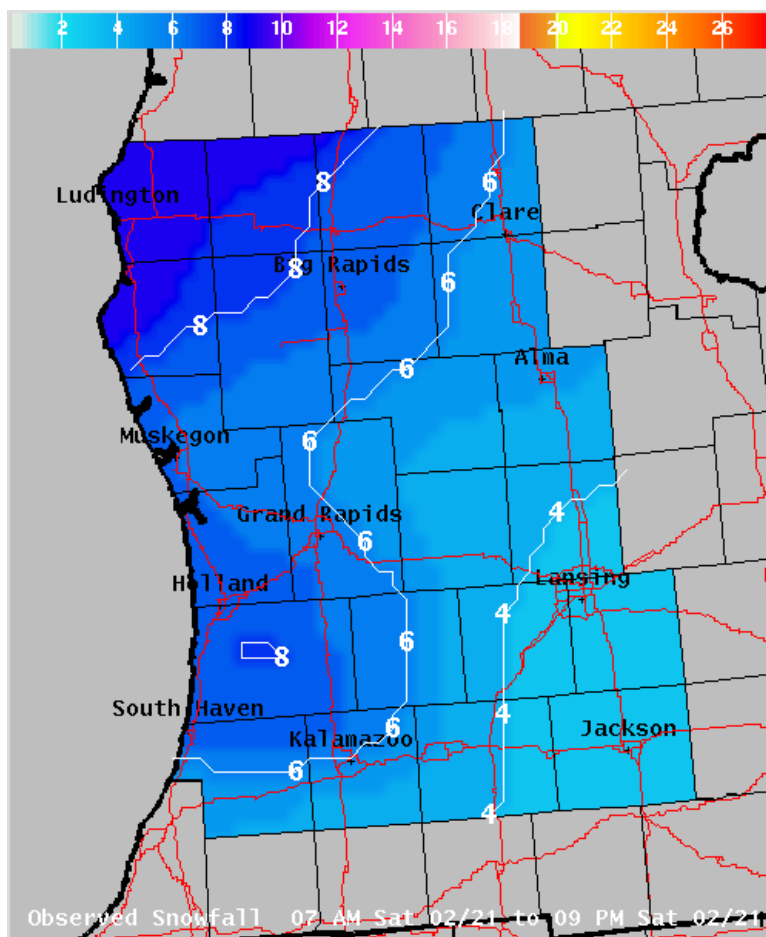


FIG.12. Snowfall totals on the 21st.

22nd-25th

This period was marked by fairly benign weather and cold morning temperatures on the 23rd and the 24th. Muskegon, however, did receive a few inches of lake effect snow on the 22nd.

26nd-28th

An area of low pressure approached Michigan from the southwest and brought milder and wetter conditions to the area. Temperatures jumped to near 50° in some locations on the 26th, and heavy rain ensued during the evening hours and lasted into the overnight hours of the 27th. Widespread rainfall accumulations of 1 to 2 inches were found across much of the region, with Grand Rapids and Muskegon setting daily rainfall records of 1.37 inches and 1.65 inches, respectively. Storm total rainfall can be seen in Figure 13. The rain and warmer temperatures dissolved all the snowpack for the majority of locations in southwest Lower Michigan. A cold front followed the storm on the 27th, which sent temperatures tumbling to below normal levels on the 28th.

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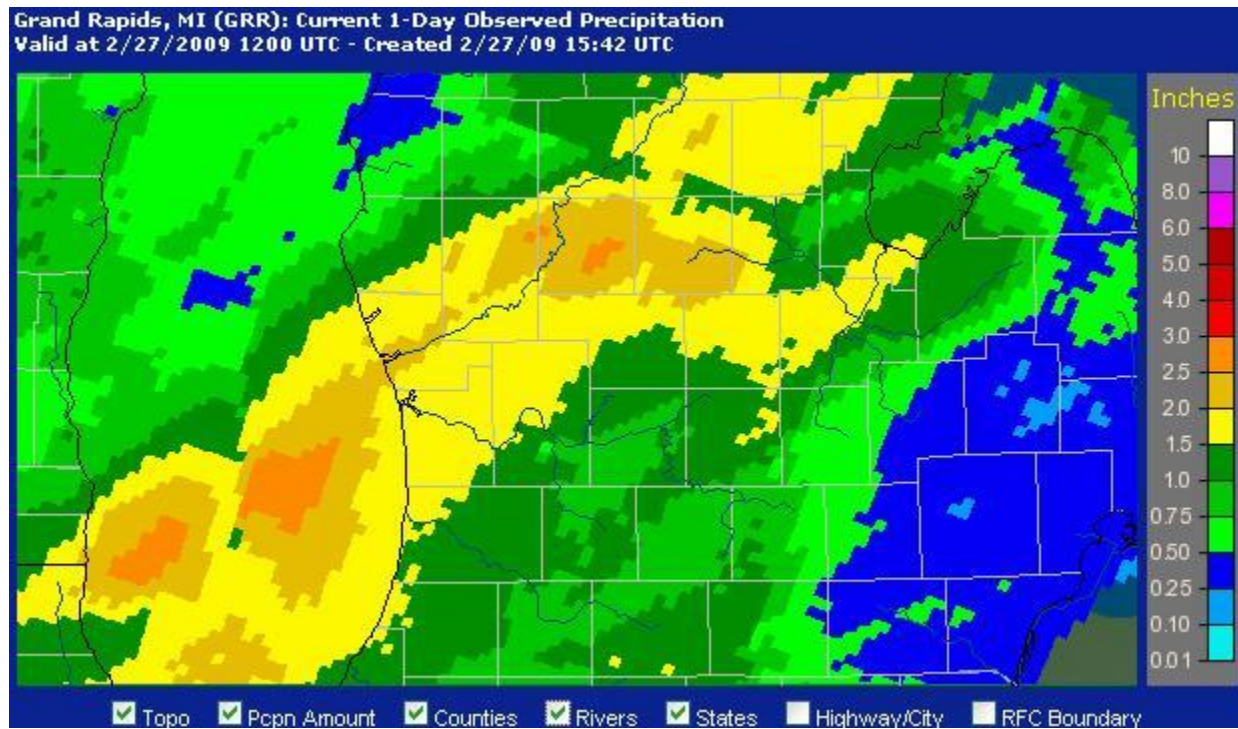


FIG. 14. Storm total rainfall ending on the 27th.